Operating instructions

Dopplersimulator MDS 77 for the adjustment of lane change assistance systems

Manufacturer	Heicks Industrieelektronik GmbH, Am Schwarzen Weg 25-31, D-59590 Geseke
Distributor	Heicks Vertriebs-GmbH, Am Schwarzen Weg 25-31, D-59590 Geseke
Product version	V001829 – Dopplersimulator MDS 77 – OEM 3

This operating instruction summarises the most important information about the Dopplersimulator MDS 77 in a clear form.

Purpose of the Dopplersimulator MDS 77

The Dopplersimulator MDS 77 is a tool for electronic calibration and functional testing of the angle measurement capability of vehicle radars.
This functional testing and calibration takes place in vehicle production or in customer service workshops. Since lane change radar systems can only detect moving objects, a stationary calibrator would not be detected. To circumvent this, the doppler effect is used for calibration. For this purpose, a metallic roller rotates in the housing of the MDS 77 Dopplersimulator and is thus detected by the lane change radar like a moving object, although it is set up at a fixed position.

Radar functionality

In the Dopplersimulator MDS 77, a metallic, cylindrical roller of a special, rotating radar modulator is mounted. A motor rotates this roller at a constant, defined speed. This rotating roller generates a point-shaped backscatter for the radar waves of the radar to be calibrated and modulates the radar waves according to the doppler effect. Due to the choice of special materials, the reflected area of the Dopplersimulator MDS 77 is approximately point-shaped.
For radars that can measure the angle to the vehicle's longitudinal axis (azimuth angle), the Dopplersimulator MDS 77 is well suited for calibrating this angle measurement capability.

Notes for using the operating instructions

- This instruction manual contains important information for operator safety.
- The operating instructions should be read completely. Pay particular attention to the first pages with the safety instructions. The safety instructions are intended solely for protection during work with the machine.
- In order to prevent danger to persons and equipment or incorrect operation, it is advisable to refer to the individual work steps again separately while using the device.
- The device may only be used by a person with motor vehicle technical training. Information and knowledge that includes this training are not listed in this operating manual.
- The manufacturer reserves the right to make changes to the operating instructions and to the unit itself without prior notice. We therefore recommend that you check for any updates. In the event of resale or any other form of transfer, this operating manual must be enclosed with or quoted from the unit.

Symbols used

	**Danger / Warning / Caution** This sign indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.		**CROSSED BIN** This sign indicates that the product must not be thrown into household waste. The bar below the gauze bin indicates whether the product was placed on the market after 13.08.2005.
	This sign indicates a dangerous electrical voltage/high voltage.		**NOTE** The texts marked with NOTE contain important and useful information. It is recommended that you read these texts.

Safety instructions

General safety instructions

- The Dopplersimulator MDS 77 is intended exclusively for use on motor vehicles. The use of the MDS 77 Dopplersimulator requires the user to have technical knowledge of the vehicle and thus knowledge of the sources of danger and risks in the workshop or the vehicle.
- Before using the device, the user must have read the operating instructions completely and carefully.
  - Each Dopplersimulator is protected against solid foreign bodies with a diameter of less than 12.5 mm and against access with a finger (IP 20).
  - Each Dopplersimulator is delivered sealed with screws.
  - Due to the rotating rotor and fan inside, there is no risk of injury during operation as long as the housing remains closed. The housing may only be opened by the manufacturer and his trained personnel.
  - The Dopplersimulator is suitable for dry indoor use only.
- If the velocity level falls below the tolerance limit, the green LED will turn off. Disconnect the device from the mains when the red LED control lamp lights up continuously and contact the manufacturer to have the device checked.
- All the instructions given in the individual chapters of the operating manual apply. The following measures and safety instructions must also be observed.
- Furthermore, all general regulations of trade supervisory authorities, employers' liability insurance associations, motor vehicle manufacturers, environmental protection requirements as well as all laws, ordinances and codes of practice to be observed by a workshop apply.

Safety instructions Dopplersimulator MDS 77

To avoid incorrect handling and resulting injuries to the user or destruction of the Dopplersimulator MDS 77, observe the following:

- Protect the MDS 77 Dopplersimulator from hard impacts and do not drop it.
- Protect the MDS 77 Dopplersimulator from prolonged exposure to sunlight.
- The MDS 77 Dopplersimulator is not waterproof. Protect the Heicks Dopplersimulator MDS 77 from liquids such as water, fuel, oil, etc.
- If the Dopplersimulator MDS 77 is damaged, accurate adjustment of the radar sensors is no longer ensured and the warranty and guarantee will become void.

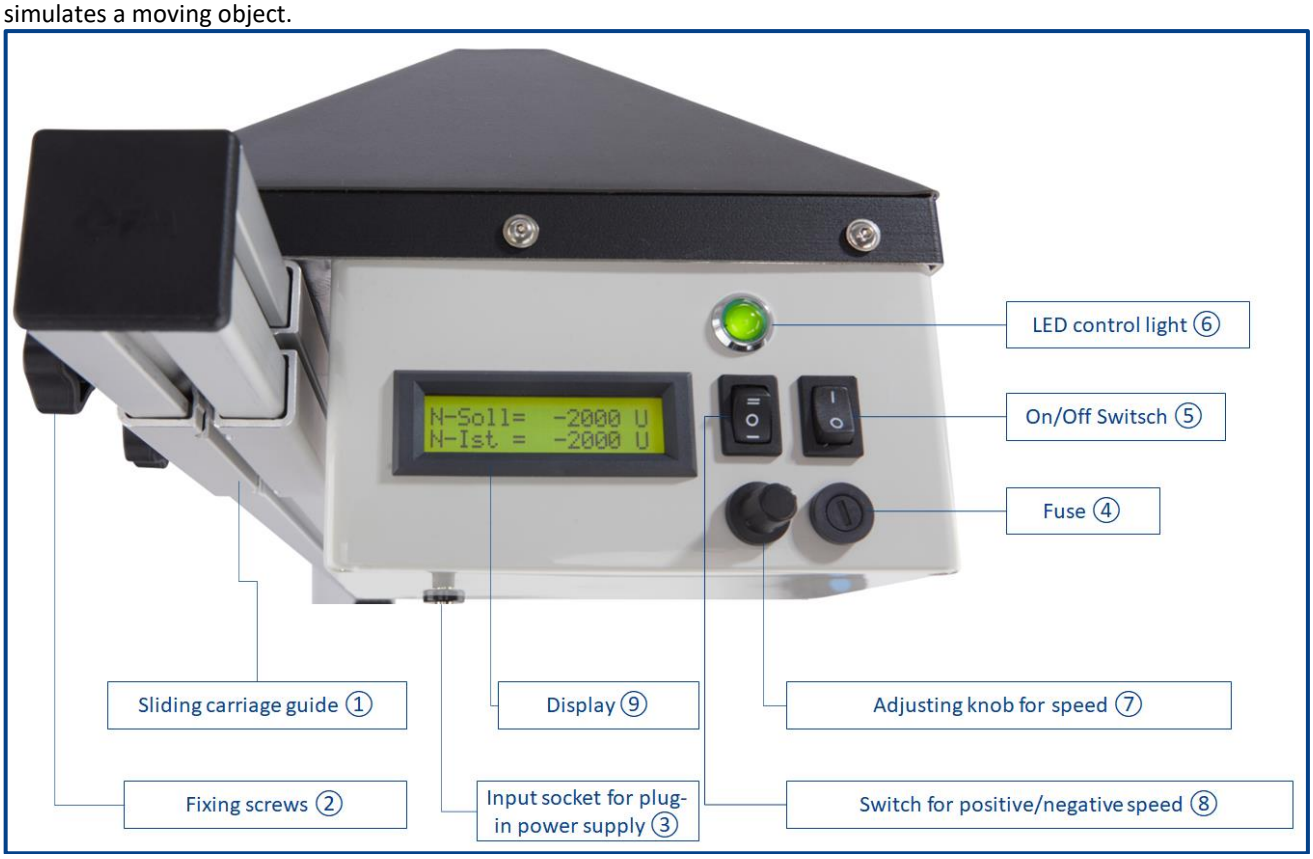
Safety instructions High/mains voltage

Very high voltages occur in electrical systems. Voltage flashovers on damaged components, e.g. marten bites or touching live components, pose a risk of electric shock. High voltage via the vehicle and mains voltage via the house mains can cause serious injuries or death if insufficient attention is paid. Therefore, observe the following:

- Only use power supply cables with grounded protective contact.
- Use only tested or enclosed power supply cable.
- Only use the original cable set.
- Check the cables and power supply units regularly for damage.
- Do not touch live components when working with the ignition switched on.

Device description (exemplary V001829)

The Dopplersimulator MDS 77 can be used to check and adjust radar sensors on vehicles. The Dopplersimulator MDS 77 simulates a moving object.



Sliding carriage guide ①
The Dopplersimulator MDS 77 is guided into the guide profile of the assembly stand with the sliding carriage guide.

Fixing screws ②
Once the Dopplersimulator MDS 77 is aligned in height, it is fixed in place with the fastening screws.

Input socket for plug-in power supply ③
The Dopplersimulator MDS 77 must be supplied with voltage via the input socket.
The supplied power supply unit supplies the Dopplersimulator MDS 77 with 24V DC voltage.

Fuse ④
A T0.5A fuse is fitted as a protective device that trips in the event of a short circuit.

On/off switch ⑤
The Dopplersimulator MDS 77 is switched on or off with the on/off switch. After switching on, the LED control lamp lights up red. After approx. 15 seconds, the unit is adjusted and ready for use. The LED control light switches from red to green.

LED control lamp⑥
After the Dopplersimulator MDS 77 has been switched on with the on/off switch, the device adjusts itself. During this adjustment time (approx. 15 sec.) the LED control lamp lights up red. After the adjustment process, the LED control light switches to green.

- If the set speed is changed with the speed adjustment knob⑦, the LED indicator light switches from green to red. The unit now adjusts the new set speed. When the new set speed is reached, the LED control light switches from red to green. This adjustment process may take a few seconds.
- If the set speed is changed with the switch for positive / negative speed⑧, the LED indicator light switches from green to red. The unit now adjusts the new setpoint speed. When the new target speed is reached, the LED control light switches from red to green. This adjustment process may take a few seconds.

Adjusting knob for speed ⑦

With the speed adjustment knob⑦, the speed can be adjusted continuously between two ranges. Both as positive or negative speed.

Switch for positive negative speed⑧

With the switch for positive / negative speed⑧ an approaching or a moving away vehicle can be simulated.

- In switch position I, a moving away object is simulated.
- In switch position II, an approaching object is simulated.

When switching the switch from switch position I to switch position II and vice versa, the switch should remain in the middle switch position 0 for 1 second.

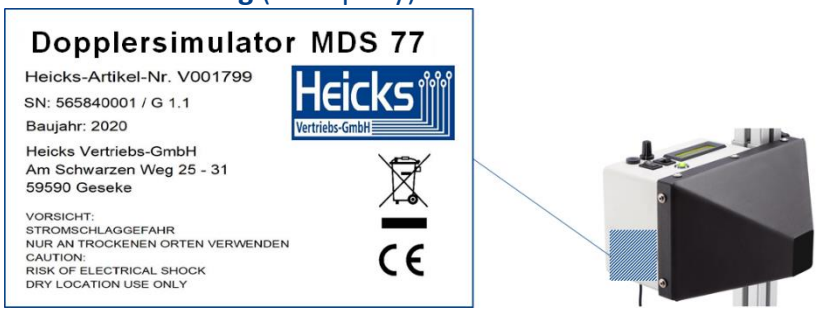
If the switch for positive / negative speed⑧ is switched to zero position, the motor stops. An asterisk appears in the display before the target speed.

If the switch for positive / negative speed⑧ is switched to zero position, the motor stops. An asterisk appears in front of the target speed in the display. *

Display ⑨

The display shows the target speed, the actual speed, the direction of rotation (+ or -) or motor standstill *. The set-point speed is specified with the speed setting knob⑦ (upper value on the display). The unit adjusts itself to the specified target speed. The current actual speed is shown on the lower half of the display. After a few seconds, the actual speed adjusts to the value of the setpoint speed, whereby a small speed deviation remains between the set-point speed and the actual speed. If the switch for positive / negative speed⑧ is switched to position 0, the set speed is reduced to 0. In front of the target speed in the upper half of the display, an asterisk * is shown instead of the + or - sign. At the actual speed, as soon as the speed falls below 2000 revolutions, ======= is displayed.

Enclosure labelling (exemplary)



General test conditions

In an ambient temperature range of +5°C to +30°C at max. 80% relative humidity, no condensation, the proper functioning of the unit is guaranteed.

Electrical function control (electronic monitoring of the roller speed)

NOTE

- After switching on the Dopplersimulator MDS 77, the LED control lamp lights up red. When the Dopplersimulator MDS 77 is working within its intended tolerances, the LED control lamp lights up green. This procedure can take up to 15 seconds.
- The Dopplersimulator MDS 77 permanently checks its parameters. It may happen that the LED indicator light lights up red even during operation if the tolerances are exceeded. In this case, no usable measurements can be carried out.
- If the LED control lamp lights up red continuously or for longer than 5 minutes, there is a fault with the unit. Please contact the service centre: Heicks Vertriebs-GmbH, Am Schwarzen Weg 25-31, 59590 D-Geseke, Tel. +49 2942 / 97926 - 0; E-Mail info@heicks.de

To start up the Dopplersimulator MDS 77, proceed as follows:

1. Switch on the Dopplersimulator MDS 77 using the on/off switch. The LED indicator light lights up red.
2. Set the desired speed and direction of rotation.
3. Wait until the LED control light is green (approx. 15 seconds). When the LED control light is green, the Dopplersimulator MDS 77 is ready for operation.

Technical data Dopplersimulator MDS 77 - OEM 3 (V001829)

Dimensions	hight 179,4mm x length 224mm x width 124mm (incl. antenna protection cap)
Weight	2,3kg without Power supply – 2,6kg incl. Power supply
Power supply	Only with approved external power supply unit
Powerswitch	On/Off
Fuse	IEC 60127-2; 250 VAC; inert T 0,5A; 5mm x 20mm
Operating light	• Green: unit operates within the specified tolerances • Red: Unit is outside the specified tolerances
Antenna outside	Horn antenna Standard Gain Horn Antenna; Freq. Range: 60.0 - 90.0 GHz; Waveguide: WR 12; Gain: 25dBI Typ; Polarzation: Linear 3dB Beamwidth (deg) 20
Speed	Adjustable via potentiometer and direction switch
Mounting	By means of telescopic profile and accessories
Protection class	IP 20
Climate	Ambient temperature between +5 and +30° C; relative humidity 80
Rated voltage	230V DC (Permissible input voltage 100V to 240V)

Care and maintenance

- Clean the Dopplersimulator MDS 77 regularly with mild cleaning agents.
- Use commercially available household cleaners in conjunction with a moistened soft cleaning cloth.
- Replace damaged accessories immediately.
- Only use original spare parts.
- The Dopplersimulator MDS 77 should be checked and/or calibrated at regular intervals (recommendation: annually). This calibration can only be carried out by the manufacturer on an original measuring station approved by the manufacturer. In the process, the HF properties are checked. For this purpose, the Dopplersimulator MDS 77 must be sent to the manufacturer.

Disposal

In accordance with Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) and the national law on the marketing, return and environmentally sound disposal of electrical and electronic equipment (Electrical and Electronic Equipment Act - ElektroG) of 16 March 2005, we undertake to take back free of charge after the end of its useful life any equipment that we have placed on the market after 13 August 2005 and to dispose of it in accordance with the above-mentioned directives.
Since this appliance is used exclusively for commercial purposes (B2B), it must not be handed in to public waste disposal companies.
The appliance can be disposed of, stating the date of purchase and the appliance numbers, at:
Heicks Vertriebs-GmbH, Am Schwarzen Weg 25-31, D-59590 Geseke, Germany.
WEEE-Reg. No. DE 79348453
Tel.: +49 2942/97926-0, Fax: +49 2942/97926-150, Mail: info@heicks.de

Simplified declaration of conformity (European Union)

This appliance complies with the essential requirements and other relevant provisions of Directives 2014/35/EU (Low Voltage Directive), 2014/30/EU (EMC Directive), 2011/65/EU (Directive on Certain Hazardous Substances), 2012/19/EU (EU Directive on Waste Electrical and Electronic Equipment). The user can see this directly from the CE mark. The full text of the EU declaration of conformity is available from the manufacturer.

CE